

PEGGY E. O'NEILL

PRESENT POSITION (January, 1980 to present):

Physical Scientist
AST, Earth Science Remote Sensing
Hydrological Sciences Laboratory / Code 617
NASA Goddard Space Flight Center
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EDUCATION:

1976 - B.S. Geography, Northern Illinois University
(summa cum laude, with university honors)
1979 - M.A. Geography, University of California,
Santa Barbara
1989-1992 - Ph.D. studies, Civil and Environmental Engineering,
Cornell University

PREVIOUS POSITIONS:

1976-1977 Teaching Assistant, Department of Geography,
University of California, Santa Barbara
1978-1979 Staff Research Associate, Geography Remote
Sensing Unit, University of California, Santa Barbara

PROFESSIONAL SOCIETIES AND COMMITTEES:

Senior Member, IEEE Geoscience and Remote Sensing Society; American Geophysical Union; Local Organizing Committee and Session Chair, MicroRAD 2010; Technical Program Committee and Session Chair, 2004-8, 2012-13 IEEE International Geoscience & Remote Sensing Symposium; IGARSS Session Co-Organizer, 2013, 2012, 2011, 2010, 2008, 2007; Program Committee, 2008 Microwave Land Hydrology Workshop; Co-Chair, 13th AMS Conference on Hydrology; Past member (2 terms), AMS Committee on Hydrology; Member, Institute for Electromagnetic Modeling and Applications; Past member, American Meteorological Society; International Association of Hydrological Sciences; AMS Scientific and Technological Activities Commission (STAC); Member, Program Committee, 1993 and 1994 AMS Conference on Hydrometeorology; Member, Technical Program Committee, Symposium S8, IAHS 3rd Scientific Assembly; Chairman, Publications and Publicity Committee, and Member, Organizing Committee, 1990 IEEE International Geoscience & Remote Sensing Symposium

RESEARCH INTERESTS:

-- research in the dynamics of moisture storage and transfer in the soil-vegetation-atmospheric boundary layer, primarily through microwave remote sensing techniques; development and validation of accurate soil moisture retrieval algorithms; application of remotely-sensed soil moisture to land surface process modeling and watershed hydrology; advanced mission definition and technology development.

SELECTED PROFESSIONAL EXPERIENCE:

- SMAP Deputy Project Scientist
- NASA representative to the NPOESS Joint Agency Requirements Group; member of JPSS Level 1 Requirements Document Working Group
- Member, NASA/THP Soil Moisture Mission Working Group, International Soil Moisture Mission Working Group, and CEOS Soil Moisture Validation-Focus Group
- Member, NPOESS Microwave Operational Algorithm Team for MIS (Microwave Imaging Sounder)
- Member, Ocean Salinity Science Team (Aquarius)
- Member, SMOS and AMSR-E calibration /validation teams
- GSFC Project Scientist for Hydros, and Member, HYDROS Science, Proposal, and Risk Reduction Teams
- Member, SMAPEx ('10, '11), SMAPVEX12, SMAPVEX08, CLASIC, NAFE'06, SMEX'05, '04, '03, & '02, SGP99, SGP97, Washita '94 & '92 experiment teams
- Principal Investigator, Development of a truck-based combined L Band radar/radiometer [ComRAD] (incl. use as a single-beam SMAP, Aquarius, and SMOS simulator)
- Principal Investigator, THP/Discovery project, Soil Moisture Retrieval through Small Tree Canopies
- Co-Principal Investigator, NASA GWEC project to examine active/pассив microwave retrievals of soil moisture under changing vegetation conditions
- Principal Investigator and Co-Investigator of several NASA hydrology RTOP tasks related to remote sensing of soil moisture and its application to land surface process modeling, and Co-Investigator, soil moisture mapping using ENVISAT ASAR data, and Co-Investigator, SIR-C experiment to examine applications of SAR to watershed hydrology
- Science Advisor on NASA ATIP/ACT/AIST technology projects related to aperture synthesis radiometry and microwave instrument sensor webs, and Co-PI, "Large 2-D STAR: Architecture Trade Study"
- Science Lead, ESTO Workshop on Materials and Structures, and Science Member, ESTO Workshop on Microwave Radiometry
- Deputy Study Scientist, HYDROSTAR proof-of-concept soil moisture study project and Principal Investigator, HYDROSTAR follow-on tasks and design studies, and Member, HYDROSTAR ESSP Proposal and Science Teams
- Member, Advanced Earth Mission Concepts and IDC Teams, and Science Team Leader, EX-4a Post-2002 NASA Mission Concept Study

AWARDS:

Recipient, Robert H. Goddard Award of Merit, 2011

Recipient of thirty-one NASA GSFC Certificate of Outstanding Performance and Special Achievement Awards 1981-2014 (plus three certificates of appreciation for mentoring activities)

Recipient, Group Achievement Award for SMAPVEX12, 2013

Recipient, 2010 Hydrospheric & Biospheric Sciences HOBI Award for Outstanding Achievement

Recipient, Robert H. Goddard Honor Award for Mentoring, 2008

Recipient, NPOESS Award for Excellence in Service to the CMIS MOAT & SSET, 2002

Recipient, ATHS Tradition of Excellence Award 2001

Recipient, 1994 IGARSS Symposium Prize Paper Award (as co-author)

Recipient, USDA Certificate of Appreciation 1994

REFEREED PUBLICATIONS:

1. Estes, J. E., P. E. O'Neill and M. Wilson, "Radar Detection of Surface Oil Accumulations," in Radar Geology: An Assessment, JPL Publication 80-61, September 1, 1980.
2. Wilson, M. J., P. E. O'Neill, J. E. Estes and M. Deutsch, "Satellite Detection of Oil on the Marine Surface," in Satellite Hydrology, ed. Deutsch, M., Wiesnet, D. R. and Rango, A., 1981, AWRA, Minneapolis, MN, pp. 593-602, 1981.
3. Rango, A. and P. E. O'Neill, "Effective Watershed Management Using Remote Sensing Technology," Remote Sensing for Resource Management, Soil Conservation Society of America, Ankeny, Iowa, pp. 301-308, 1982.
4. Njoku, E. G. and P. E. O'Neill, "Multifrequency Microwave Radiometer Measurements of Soil Moisture," IEEE Trans. on Geosci. and Rem. Sens., GE-20, No. 4, pp. 468-475, October, 1982.
5. Wang, J. R., P. E. O'Neill, T. J. Jackson and E. T. Engman, "Multifrequency Measurements of the Effects of Soil Moisture, Soil Texture, and Surface Roughness," IEEE Trans. on Geosci. and Rem. Sens., GE-12, No. 1, pp. 44-51, January 1983.
6. Blanchard, B. J. and P. E. O'Neill, "Estimation of the Hydraulic Character of Soils with Passive Microwave Systems," Proceedings of the Conf. on Advances in Infiltration, ASAE, Chicago, IL, December 1983. (Peer reviewed)
7. Jackson, T. J., T. J. Schmugge and P. E. O'Neill, "Passive Microwave Remote Sensing of Soil Moisture from an Aircraft Platform," Remote Sensing of Environment, 14, pp. 135-151, 1984.
8. O'Neill, P. E., T. J. Jackson, B. J. Blanchard, J. R. Wang and W. I. Gould, "Effects of Corn Stalk Orientation and Water Content on Passive Microwave Sensing of Soil Moisture," Remote Sensing of Environment, 16, pp. 55-67, 1984.
9. O'Neill, P. E., "Microwave Remote Sensing of Soil Moisture: A Comparison of Results from Different Truck and Aircraft Platforms," International Journal of Remote Sensing, Vol. 6, No. 7, pp. 1125-1134, 1985.
10. Jackson, T. J. and P. E. O'Neill, "Aircraft Scatterometer Observations of Soil Moisture on Rangeland Watersheds," International Journal of Remote Sensing, 6, No. 7, pp. 1135-1152, 1985.
11. Schmugge, T. J., P. E. O'Neill and J. R. Wang, "Passive Microwave Soil Moisture Research," AgRISTARS Special Edition, IEEE Transactions on Geoscience and Remote Sensing, GE-24, No. 1, pp. 12-22, 1986.
12. Camillo, P. J., P. E. O'Neill and R. J. Gurney, "Estimating Soil Hydraulic Parameters Using Passive Microwave Data," IEEE Transactions on Geoscience and Remote Sensing, GE-24, No. 6, pp. 930-936, 1986.
13. Jackson, T. J. and P. E. O'Neill, "Microwave Dielectric Model for Aggregated Soils," IEEE Transactions on Geoscience and Remote Sensing, GE-24, No. 6, pp. 920-929, 1986.
14. Jackson, T. J. and P. E. O'Neill, "Temporal Observations of Surface Soil Moisture Using a Passive Microwave Sensor," Remote Sensing of Environment, 21, pp. 281-296, 1987.

15. Jackson, T. J. and P. E. O'Neill, "Salinity Effects on the Microwave Emission of Soils," IEEE Transactions on Geoscience and Remote Sensing, GE-25, No. 2, pp. 214-220, 1987.
16. Jackson, T. J., M. E. Hawley and P. E. O'Neill, "Preplanting Soil Moisture Assessment Using Passive Microwave Sensors," Water Resources Bulletin, 23, No. 1, pp. 11-19, 1987.
17. Promes, P. M., T. J. Jackson, and P. E. O'Neill, "Significance of Agricultural Row Structure on the Microwave Emissivity of Soils," IEEE Transactions on Geoscience and Remote Sensing, GE-26, September 1988, No. 5, pp. 580-589, 1988.
18. O'Neill, P. E. and T.J. Jackson, "Observed Effects of Soil Organic Matter Content on the Microwave Emissivity of Soils," Remote Sensing of Environment, 31, pp. 175-182, 1990.
19. Jackson, T. J. and P.E. O'Neill, "Attenuation of Microwave Emission by Corn and Soybeans at 1.4 and 5 GHz," IEEE Trans. Geoscience and Remote Sensing, 28, no. 5, pp. 978-980, 1990.
20. Jackson, T. J. and P.E. O'Neill, "Microwave Emission and Crop Residues," Remote Sensing of Environment, 36, pp. 129-136, 1991.
21. Jackson, T.J., D.M. LeVine, A. Griffis, D.C. Goodrich, T.J. Schmugge, C.T. Swift and P.E. O'Neill, "Soil Moisture and Rainfall Estimation over a Semiarid Environment with the ESTAR Microwave Radiometer," IEEE Trans. on Geoscience and Remote Sensing, 31, No. 4, pp. 836-841, July, 1993.
22. O'Neill, P.E., T.J. Jackson, N.S. Chauhan and M.S. Seyfried, "Microwave Soil Moisture Estimation in Humid and Semiarid Watersheds," Advances in Space Research, Vol. 13, No. 5, pp. 115-118, 1993.
23. O'Neill, P.E., N.S. Chauhan, and T.J. Jackson, "Use of Active and Passive Microwave Remote Sensing for Soil Moisture Estimation Through Corn," International Journal of Remote Sensing, Vol. 17, No. 10, pp. 1851-1865, 1996.
24. Shi, J., J. Wang, A. Hsu, P. O'Neill, and E. Engman, "Estimation of Bare Surface Soil Moisture and Surface Roughness Parameters Using L-Band SAR Image Data," IEEE Trans. on Geoscience and Remote Sensing, Vol. 35, No. 5, pp. 1254-1266, 1997.
25. Wang, J.R., A. Hsu, J.C. Shi, P.E. O'Neill, and E.T. Engman, "Estimating Surface Soil Moisture From SIR-C Measurements Over the Little Washita River Watershed," Remote Sensing of Environment, 59: 308-320, 1997.
26. Jackson, T. J., P. E. O'Neill, and C. T. Swift, "Passive Microwave Observation of Diurnal Surface Soil Moisture," IEEE Trans. on Geoscience and Remote Sensing, GE-35, No. 5, pp. 1210-1222, 1997.
27. Burke, E. J., R. J. Gurney, L. P. Simmonds, and P. E. O'Neill, "Using a Modeling Approach to Predict Soil Hydraulic Properties from Passive Microwave Measurements," IEEE Trans. on Geoscience and Remote Sensing, vol. 36, no. 2, pp. 454-462, 1998.
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29. Schmugge, T.J., T.J. Jackson, P.E. O'Neill, and M.B. Parlange, "Observations of Coherent Emissions from Soils," Radio Science, vol. 33, no. 2, pp. 267-272, 1998.

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33. Cahill, A., M. Parlange, T. Jackson, P. O'Neill, and T. Schmugge, "Evaporation from Nonvegetated Surfaces: Surface Aridity Methods and Passive Microwave Remote Sensing," *Journal of Applied Meteorology*, vol. 38, pp. 1346-1351, 1999.
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35. Shi, J-C, K. S. Chen, Q. Li, T. J. Jackson, P. E. O'Neill, and L. Tsang, "A Parameterized Surface Reflectivity Model and Estimation of Bare Surface Soil Moisture with L-Band Radiometers," *IEEE Trans. on Geoscience and Remote Sensing*, vol. 40, no. 12, pp. 2674-2686, 2002.
36. Njoku, E., V. Lakshmi, and P. O'Neill, *Guest Editors, Special Issue on SMEX02, Remote Sensing of Environment*, vol. 92, Issue 4, September, 2004.
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39. Moran, S., P. O'Neill, and T. Jackson, *Guest Editors, Special Issue on SMEX04, Remote Sensing of Environment*, Vol. 112, no. 2, February, 2008
40. Zhan, X., W. Crow, T. Jackson and P. O'Neill, "Improving Spaceborne Radiometer Soil Moisture Retrievals with Alternate Aggregation Rules for Ancillary Parameters," *IEEE Geoscience and Remote Sensing Letters*, Vol. 5, No. 2, July, 2008, pp. 261-265.
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43. Kurum, M., R. Lang, P. O'Neill, A. Joseph, T. Jackson, and M. Cosh, "L Band Radar Estimation of Forest Canopy Attenuation for Active/Passive Soil Moisture Inversion," [IEEE Trans. on Geoscience and Remote Sensing](#), MicroRad08 Special Issue, 47 (9), September, 2009, pp. 3026-3040, doi: 10.1109/TGRS.2009.20026641.
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45. Entekhabi, D., E. Njoku, P. O'Neill, K. Kellogg, etc. (SDT plus project personnel), "The Soil Moisture Active Passive (SMAP) Mission," [Proceedings of the IEEE](#), vol. 98, no. 5, May, 2010, pp. 704-716.
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47. Joseph, A., P. O'Neill, R. van der Velde, R. Lang, and T. Gish, "Effects of Corn on C- and L-Band Radar Backscatter: A Correction method for Soil Moisture Retrieval," [Remote Sensing of Environment](#), vol. 114, 2010, pp. 2417-2430, doi: 10.1016/j.rse.2010.05.017.
48. Cosh, M., J. Tao, T. Jackson, L. McKee, and P. O'Neill, "Vegetation Water Content Mapping in a Diverse Agricultural Landscape: National Airborne Field Experiment 2006," [Journal of Applied Remote Sensing](#), vol. 4, 043532, 2010.
49. Kurum, M., R. Lang, P. O'Neill, A. Joseph, T. Jackson, and M. Cosh, "A First-Order Radiative Transfer Model for Microwave Radiometry of Forest Canopies at L-band," [IEEE Trans. on Geoscience and Remote Sensing](#), MicroRad10 Special Issue, vol. 49, no. 9, September, 2011, pp. 3167-3179, doi: 10.1109/TGRS.2010.2091139. [cover of journal]
50. Kurum, M., P. E. O'Neill, R. H. Lang, A. T. Joseph, T. J. Jackson, and M. H. Cosh, "Effective Tree Scattering and Opacity at L-Band," [Remote Sensing of Environment](#), vol. 118, March, 2012, pp. 1-9, doi: 10.1016/j.rse.2011.10.024.
51. Kurum, M., P. O'Neill, R. Lang, M. Cosh, A. Joseph, and T. Jackson, "Impact of Conifer Forest Litter on Microwave Emission at L-Band," [IEEE Trans. on Geoscience and Remote Sensing](#), vol. 50, no. 4, April, 2012, pp. 1071-1084, doi: 10.1109/TGRS.2011.2166272.
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54. Salama, M., R. van der Velde , H. van der Woerd , J. Kromkamp , K. Philippart , A. Joseph , P. O'Neill , R. Lang , T. Gish , J. Werdell , and Z. Su, "Calibration and Validation of Geophysical Observation Models," [Biogeosciences](#), 9, 2012, pp. 2195-2201, doi: 10.5194/bg-9-2195-2012.

55. Joseph, A., P. O'Neill, R. van der Velde, E. Kasischke, E. Kim, R. Lang and T. Gish, "Variations in the b-parameter uncertainties retrieved from C- and L-band radiometer data," [IEEE Trans. on Geoscience and Remote Sensing](#), in review, 2012.
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57. O'Neill, P., S. Chan, E. Njoku, T. Jackson, and R. Bindlish, *Algorithm Theoretical Basis Document for SMAP L2 and L3 Radiometer Soil Moisture (Passive) Data Products: L2_SM_P and L3_SM_P*, Initial Release v.1, JPL, Pasadena, CA, October, 2012. [Project, HQ and peer reviewed]
58. Bindlish, R., T. Jackson, M. Cosh, T. Zhao, and P. O'Neill, "Global Soil Moisture from the Aquarius Satellite: Description and Initial Assessment," submitted to [IEEE Geoscience and Remote Sensing Letters](#), September, 2013.
59. Srivastava, P., D. Han, M. Ramirez, P. O'Neill, and T. Islam, "Sensitivity of SMOS soil moisture retrieval parameters using Land Parameter Retrieval Model and tau-omega rationale for hydrological applications," submitted to [Journal of Hydrology](#), October, 2013; accepted for publication, July, 2014.
60. DeGloria, S., D. Beaudette, J. Irons, Z. Libohova, P. O'Neill, P. Owens, P. Schoeneberger, L. West, and D. Wysocki, "Emergent Imaging and Geospatial Technologies for Soil Investigations," [Photogrammetric Engineering and Remote Sensing](#), vol. 80, no. 4, April, 2014, pp. 289-294.
61. Miernecki, M., J-P. Wigneron, E. Lopez-Baeza, Y. Kerr, R. De Jeu, G. De Lannoy, T. Jackson, P. O'Neill, M. Schwank, R. Moran, S. Bircher, H. Laurence, A. Mialon, A. Al Bitar, and P. Richaume, "Comparison of SMOS and SMAP soil moisture retrieval approaches using tower-based radiometer data over a vineyard," submitted to [Remote Sensing of Environment](#), February, 2014; accepted July, 2014.
62. Srivastava, P., P. O'Neill, M. Cosh, M. Kurum, R. Lang, and A. Joseph, "Evaluation of dielectric mixing models for microwave soil moisture retrieval using data from the Combined Radar / Radiometer (ComRAD) ground-based SMAP simulator," submitted to IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS), April, 2014.
63. Parrens, M., J-P. Wigneron, P. Richaume, A. Albitar, A. Mialon, S. Wang, R. Fernandez-Moran, A. Alyaari, P. O'Neill, and Y. Kerr, submitted to [IEEE Trans. on Geoscience and Remote Sensing](#), August, 2014.

OTHER PUBLICATIONS:

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2. O'Neill, P.E., S. G. Atwater and J. E. Estes, "Ground Truth Data Report: 1978 Kern County, California Microwave/Thermal Infrared Soil Moisture Experiment," Final Report, NASA, JPL Contract No. 955032, 1978.
3. Atwater, S. G., P. E. O'Neill and J. E. Estes, "Ground Truth Data Report: 1979 Kern County, California Microwave/Thermal Infrared Soil Moisture Experiment," Final Report, NASA, JPL Contract No. 955032, 1979.
4. Wilson, M. J., P. E. O'Neill, E. J. Hajic, A.J. Lewis and J. E. Estes, "Analysis of Seasat-A SAR Data for the Detection of Oil on the Ocean Surface," Final Report, U.S.G.S. Grant No. 14-08-001-G-560, 1979.
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8. O'Neill, P., T. Jackson, B. Blanchard, R. van den Hoek, W. Gould, J. Wang, W. Glazar, and J. McMurtrey, "The Effects of Vegetation and Soil Hydraulic Properties on Passive Microwave Sensing of Soil Moisture: Data Report for the 1982 Field Experiments," III, TM 85106, NASA/GSFC, Greenbelt, MD, 1983.
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11. Blanchard, B. J. and P. E. O'Neill, "Radar Response from Vegetation with Nodal Structure," TM 86066, NASA/GSFC, Greenbelt, MD, 1984.
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13. Jackson, T. J., P. E. O'Neill, G. van der Kolff, G. J. Koopman and J. R. Wang, "Effects of Soil Properties on the Microwave Emission of Soils," Proc. of the 4th International Symposium on Remote Sensing for Soil Survey, International Society of Soil Science, Wageningen and Enschede, The Netherlands, March 4-8, 1985.

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15. Jackson, T. J., M. E. Hawley, J. Shiue, V. Delnore, P. E. O'Neill, M. Owe and R. W. Lawrence, "Assessment of Preplanting Soil Moisture Using Airborne Microwave Sensors," Proc. of the International Workshop on Hydrologic Applications of Space Technology, IAHS, Cocoa Beach, FL, August 18-24, 1985.
16. O'Neill, P. E., P. J. Camillo and R. J. Gurney, "Estimation of Soil Hydraulic Properties with Microwave Techniques," invited paper, Proc. of IGARSS '85, IEEE, Amherst, MA, October, 1985.
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